

REMARKS

In response to the objection, claims 1 and 5 have been amended as suggested by the Examiner. Withdrawal is respectfully requested.

Claims 1-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 07-195617 (JP '617) in view of U.S. Patent 6,099,924 to Nakamaki et al. or U.S. Patent 6,071,599 to Kosuge et al.

JP '617 was cited as teaching a resin-coated metal sheet and a metal can obtained therefrom, the resin coating composition comprising 75-99 weight % of a polyethylene terephthalate copolyester and 1-25 weight % of a dispersed ethylene ionomer resin. The resin coating composition is said to further contain Na or Zn as a seed metal, which coating composition may further comprise conventional additives. The Examiner relied on Kosuge et al. and Nakamaki et al. as teaching the use of antioxidants in polyester metal coating compositions including tocopherol. The reason for rejection was that it would have been obvious to include a conventional antioxidant such as tocopherol, in the polyester coating composition of JP '617 to arrive at the present invention.

Applicants traverse, and respectfully request the Examiner to reconsider for the following reasons.

Characteristics of the Present Invention:

An important characteristic in the present invention is that the thermoplastic resin layer provided on the surface of the metal substrate comprises a polyester resin of a polyethylene terephthalate as a main component, an ethylene polymer and 0.05 to 3% by weight of a

tocopherol or a derivative thereof. The thermoplastic resin layer of this combination makes it possible, for the first time, to satisfy the requirements of shock resistance, adhesion and corrosion resistance.

That is, the coated layer comprising a polyester resin and an ionomer resin disclosed in JP '617 is not capable of fully satisfying the shock resistance, adhesion and corrosion which are properties required by metal cans.

In an attempt to improve such properties according to the present invention, a tocopherol was discovered. As described in the specification of this application, tocopherol has surely been known as an antioxidant. It has been known that a reduction in shock resistance can be suppressed by blending the polyester resin with the tocopherol to thereby prevent a reduction in molecular weight. According to the present invention, however, a polyester composition comprising a polyester resin containing a polyethylene terephthalate as a main component and an ethylene polymer, is blended with a tocopherol in a predetermined amount to improve not only the shock resistance in a traditional manner but also to markedly improve corrosion resistance. Particularly, this is achieved by preventing corrosion that stems from the cracks occurring even under severe conditions during retort sterilization or aging in a hot vendor, which is a new and unexpected effect.

Comparison of the Present Invention with the References:

JP '617 discloses that a resin film comprising a polyester resin containing 50 to 95 mol % of a terephthalic acid as a carboxylic acid component, 50 to 5 mol % of an isophthalic acid/orthophthalic acid and an ethylene glycol as a dihydroxy component which is a main

component, and an ionomer resin, can be blended with conventional additives, but does not at all describe or suggest the tocopherol. As described above, further, the coating layer comprising the polyester resin and the ionomer resin, is not capable of fully satisfying the shock resistance, adhesion and corrosion resistance required for metal cans.

Nakamaki et al. discloses a tocopherol as an antioxidant used for a polyester resin coating, as pointed out by the Examiner. However, the polyester resin used by Nakamaki et al. contains an aliphatic dibasic acid having poor heat stability, and is drastically different in thermal properties from the polyester resin which mainly comprises a polyethylene terephthalate used in JP '617. Namely, Nakamaki et al. discloses a general antioxidant in order to improve the thermal decomposition of the polyester resin that has poor heat stability. Therefore, it is not at all obvious to select a tocopherol from general antioxidants for improving heat decomposition of the thermally unstable polyester resin in forming a resin coating comprising a polyester resin of a polyethylene terephthalate as a main component and an ionomer resin in an attempt to improve corrosion resistance, shock resistance and resistance against high temperature and humidity even when subjected to severe conditions.

Kosuge et al., too, discloses a tocopherol as an antioxidant used for a polyester resin coating as pointed out by the Examiner. However, the polyester resin contains an aliphatic dibasic acid and has poor thermal stability like that of Nakamaki et al., and is different in thermal properties from the polyester that is used in combination with the ionomer taught in JP '617.

Like Nakamaki et al., therefore, Kosuge et al. simply describes a general antioxidant for improving heat decomposition of the thermally unstable polyester resin, different in thermal

properties from the polyester resin of JP '617. Therefore, it is not easy to select the above tocopherol for blending in the resin composition comprising the ionomer resin and the polyester resin having thermal properties different from the polyester resin taught by Kosuge et al.

For the above reasons, it is respectfully submitted that claim 1 is patentable over JP '617 in view of Nakamaki et al. or Kosuge et al., and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Applicants further comment on separate patentability of the dependent claims as follows.

Although acknowledging that JP '617 does not teach the melt viscosity of the polyester, which is an indication of molecular weight, and the particle size of the ionomer resin particles dispersed in the polyester, the Examiner considered those properties to be known result-effective variables affecting the coating properties of the composition. Hence, the Examiner considered that one of ordinary skill in the art would have been motivated to determine the suitable operating range of these properties to provide the necessary coating properties for a particular coating method.

In the present invention, however, the viscosity characteristics defined in claim 3 are important for developing properties of the coating layer comprising the polyester, the ethylene polymer and the tocopherol of the present invention to a maximum degree. Further, the diameter of particles from the ethylene polymer dispersed in the polyester is a factor that considerably affects the properties of the resin, and is specific to the present invention. This is also clear from Table 6 of the specification which shows the results of Example 18 and Comparative Examples 7 and 8. In Comparative Examples 7 and 8 in which the melt viscosity and the dispersion particle

size fall outside the scope of claims 3 and 5, the film-forming property, retort resistance and dent resistance are inferior to those of Example 18.

Withdrawal of all rejections and allowance of claims 1-8 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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